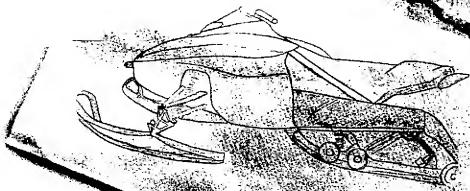


## **EXHIBIT DD**



## Birth of the REV

### Outside the Box and Into History

\* STORY BY C J RAMSTAD \*

Images courtesy Brian Souder/Bombardier Corporation. Additional action/racing photos by CJ Ramstad

Consider the power of the paper napkin. In snowmobiling over the years, many of the vehicle's defining ideas and key designs started on this humble square of paper, sketched in the midst of an animated conversation when thoughts and emotions are flowing freely and the constraints of day to day reality are suspended. Sentences start with "what if..." and a marker moves across the soft, nubbly surface never meant for this purpose but somehow always at hand when the juices begin to flow.

In a classic sense, the paper napkin of legend was witness to the germination of the core ideas which grew over time to become the startling Ski-Doo REV snowmobile. But a look behind the scenes suggests there was more, much more. If this concept sketched on scraps of paper would ever see daylight, many other elements would need to be present and brought to bear.

For an idea to reach fruition, it must be nurtured. An idea needs an environment to grow in, a process to contain it, visionaries to support it, true believers to grind out the details. An idea like this needs talented designers, engineers and technicians capable of holding on to the soul of the idea through all the twists and turns, triumphs and disappointments, delays and dead-ends.

The *what-if* that launched what would result in the REV six years later was a concept hatched by two members of a newly formed Advanced Concepts Team (ACT) working in what was called the "little garage." The idea of the team was to provide a process for developing ideas deemed not possible to hatch inside the context of the

larger company. An independent, free-flowing, separate design group had first been tried in Bombardier's personal watercraft division in 1995 and this fledgling effort had borne immediate fruit in the form of the successful suspension seat used in the popular Sea-Doo XP and HX models.

This first team for watercraft was the brainchild of Design VP Denis LaPointe who suggested a small, nimble, creative team charged with exploring new concepts and ideas without the normal constraints of feasibility, marketing and production issues. After the Sea-Doo successes, then division president Pierre Beaudoin asked LaPointe to return to Valcourt from the Sea-Doo center in Florida. LaPointe agreed on the condition he would be allowed to set up an ACT for the snowmobile products as well.

Thus it was in 1996, Berthold Fecteau and Bruno Girouard found themselves working in the newly-created snowmobile ACT looking at

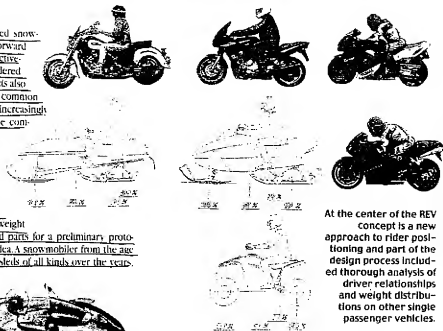
among other things, new approaches to designing a snowmobile. These two were sort of an odd couple; Fecteau a long-time snowmobiler blending his passion with his job as a technician for Bombardier, Girouard an engineer with a weekend passion for motocross who had never ridden a snowmobile before landing at the Bombardier ACT. The pair was intrigued by the differences and similarities between snowmobiles and motorcycles and, during their many conversations on the subject, Fecteau reflected on something that had puzzled him about snowmobiles for some time. The snowmobile rider, he explained to Girouard, sits significantly farther back on the chassis



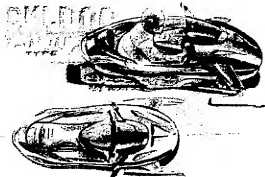
than a motorcyclist does. He noticed snowmobilers often pulled themselves forward when riding aggressively as if instinctively centering their weight, and wondered what it might mean for design. He was also intrigued by the stand-up position, common in motocross, which had grown increasingly popular in the growing snowmobile competition called snoocross.

Was there something going on here the pair could develop into an idea?

As a motorcyclist himself and an engineer with proven talent in the vehicle dynamics area, Girouard began an analysis of vehicle/rider weight distributions while Fecteau gathered parts for a preliminary prototype based on their drive-forward idea. A snowmobiler from the age of 10 and builder of many different sleds of all kinds over the years,



At the center of the REV concept is a new approach to rider positioning and part of the design process included thorough analysis of driver relationships and weight distributions on other single passenger vehicles.



Ski-Doo operates a design studio not unlike those operated at the automakers. Concept drawings for snowmobiles, accessories, clothing and more are developed in a steady stream and some ultimately impact the products, both directly and indirectly.

Fecteau devoted uncounted hours to seeing his "baby" take shape. He knew from the start it was radical and it would take some serious doing to convince anyone this idea represented a direction Ski-Doo should explore.

The drawings produced as the two innovators pursued their idea show the concept, though still light-years away from a production vehicle, was eerily close to the REV image almost right from the start.

At first, the odd little sled was extracurricular. The pair worked on their idea during lunch hours, after work and on weekends. Since the project was "off the boards" even for the ACT group, there was no funding. The first design came together using parts gathered from scrap piles. A tunnel was obtained, then a hood and a seat from a Sea-Doo and some chassis parts from the test shops and discarded field test units in the engineering area.

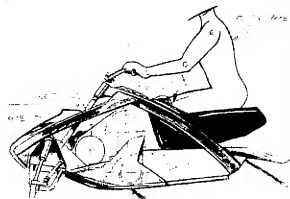
While the rough proto was taking shape, the pair explored the parameters of what was fast becoming much more than scribbles on napkins. The what-ifs were flying fast and furious as Girouard worked at his cam-cad to get the weight distribution, the suspension mounts and frame details developed. The pair agreed that since they were far field anyway they would gather design inspiration from anywhere and everywhere. Racecars, motorcycles, concept automobiles, ATVs and more passed in review as the pair formed some of the concepts that would one day be part of the production REV.

The very earliest drawings and models showed several of these concepts right from the start. Girouard had a design for the extruded

spindle right away while an early single arm strut front end quickly gave way to a full double wishbone for the ski suspension. The steering post, in front of the engine from the very earliest concept drawings, was never an issue. It was agreed after analyzing rider positioning experiments the rider would need to move up and forward. These changes led to others. It was decided the engine mass would need to move back at least a couple of inches, maybe more, to get the center of gravity located properly.

The ACT where this concept was coming together in the background is charged with keeping an eye on the world and it's a job taken very seriously. Designs from the clothing world, sunglasses, production and concept automobiles, motorcycles, high fashion and more are tracked and analyzed as part of the group's day-to-day activities. Still, even in this free-wheeling setting, the president and still unnamed REV would need a lucky break to move to the next level—as a funded, scheduled project.

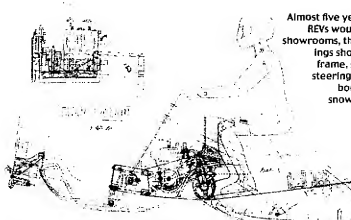
The break came when Pierre Beaudoin paid a visit to the ACT center to review the team's progress with several other ongoing projects. Walking through the fabrication area, he spotted the driver forward chassis under a tarp and asked what it was. Having no choice



The driver/cockpit orientation took months of study and at least three running prototypes to distill. This early drawing, more conceptual than diagrammatic, displays a decarbon type ski suspension that was never seriously considered.



The ski suspension featuring the extruded spindle, double ball-jointed wishbones and Precision skis appeared early in the process and survived through prototyping to production with only detail changes.



Almost five years before the first REVs would appear in dealer showrooms, the schematic drawings showed the triangular frame, short seat, forward steering post, angled wishbones and articulated snowlap. Amazingly, all these concepts appear on the final production for 2003.

but to reveal what they had been moonlighting for several months. Fectean and Girouard gave their division president an up close look.

Beaudoin liked what he saw. From the start, he said one attribute of the idea that attracted him was it was so different. He believed snowmobile product in the late 1980s was very much the same model to model and brand to brand. He wanted to see something visually and technologically different and he saw the stubby little test rig as a step in that direction.

Green light. The go-ahead was given to build a complete, scheduled, full-crew prototype, a fully operational "mule" that Beaudoin and his executive staff could evaluate during the winter of 1997-1998. Some of the graphics accompanying this story are from that exciting time when the concepts got their chance to be proven a go or no-go.

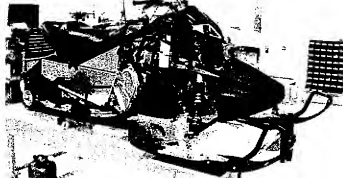
During these crucial months, the concept was still under the direction of Denis LaPointe and the ACT team, so most of the work revolved around design rather than production issues and no time was spent preparing anything for a future build. The project leader at ACT during this time was Jean Guy Talbot, a Bombardier legend who had been responsible for many milestone snowmobiles during his long career at the company including the coincidentally named RV series of the '80s.

The someday REV still needed to jump through a few hoops before it could ever hope to see the light of day, but Talbot had been there before and his resolve would be vital. As with any project, there were supporters and there were detractors. Despite the attention and inputs of talent the project was increasingly receiving, the future of the concept as the first design mule took shape remained obscure.

There was an operational mule ready to go for the winter of 1998,



Computer-aided design can't perform the crucial final details. The driver position emerged in styling only after on-the-snow tests proved the forward knee position in the P2 prototype.



The flip-up full hood remained part of the design almost until the end. Note the handmade fuel tank, radiator and separate fairing in place on this proto under construction.

but many issues were still unresolved. More of a "cave racer" in layout, the ergos were not as effective as had been hoped. Still, this first operational proto showed promise. Beaudoin remained supportive and work began on a second sled to be built in ACT for further review in 1999.

With the knowledge gained from the cave racer original, the second mule displayed many more REV characteristics in both packaging and operation. After some limited testing and review of the next generation mule during this second winter of ACT development the go-ahead came for sending the sled to the mainstream engineering department and in May of 1999, the REV moved to production engineering status.

Now the project received full attention as an engineer with 15 years of experience, Robert Handfield, was assigned as project leader. Moving over from a role in ACT, Germain Cadotte remained in charge of styling for the emerging sled. For Cadotte, the key to the REV was it was different and the focus remained throughout the R&D process on maintaining this image of difference.

Working with Dany Garand, who would later move to Audi to work on the A8, Cadotte honed the design of the rear snowlap, the interchangeable seat back, the instrument cluster and details including the clear plastic "frills" used on the production cowls to direct airflow. The "edge school" overall styling theme was applied as part of Cadotte's outside the box approach to building the very different new Ski-Doo work-in-progress.

While ultimate production of the sled was still very much in doubt, at least many of the key designs and components would be prepared for a full R&D sequence with the transfer of the project to Ski-Doo Engineering. Work on the first full engineering prototype—dubbed P1



One design goal followed throughout the process was to make the sled appear smaller. The short tunnel section and stub nosed look were part of that theme that begins to take shape on this test machine under assembly as the clock ticks toward midnight.

was begun. Some of the photographs illustrate the construction of this machine.

During the winter of 2001, opinion at the division had shifted much more in favor of the new concept and, sensing what it had, Bombardier pulled a thick veil of secrecy around the project to ward off potential leaks. To assure the project remained under wraps, most of the testing of P1 took place in Finland. Utilizing remote sites controlled by Nordrac and with racer Janne Tappin in the saddle, on-the-snow testing began in earnest that season. This sled featured a one-piece hood without the fold-down side panels and many other details which would appear later but the ski suspension and the Precision skis that would actually roll out sooner on production 2002s were essentially as we see them today.

By the end of testing that winter, the ergonomics and component location work was nearing completion. While the sled still had a long way to go, work began prior to the winter of 2001 on yet another proto-P2 - as stylists were set to work to finalize the exact shape and structure of the sled. Production was now almost a sure thing - if the sled could pass muster with testers and race drivers in North America.

As the winter of 2001 began, the second-generation engineering R&D prototype was nearing completion. This machine, although still essentially handmade from billet, sheet and tubing, looked and felt and performed like the production REV which would be scheduled for production for the 2003 season. This machine, still displaying the crudeness of a handbuilt, now featured the small nose hatch and fold down side panels that would survive to production.

During that season snowcrossers Todd Wolff and DJ Eckstrom flew to Valcourt to perform further in-the-saddle testing as parts and components were readied for pre-production. Barring a meltdown during this beta testing phase, factory assembled REV's would roll off the line in the fall of 2001, ready for introduction as Ski-Doo's modified factory snowcross racing sled and, in fully decorated form a bit later, as prototypes for photograph and press introductions.

In separate action taking place about this time, Bombardier signed snowcross superstar Blair Morgan as one of a handful of "super teams"



High-Flying Blair Morgan posted a near-sweep double championship in indoor competition and nearly topped the WSA National series Open Class as well in 2002.

for the 2002 racing season. Morgan and his crew visited Valcourt during the summer of 2001 to view the sleds prior to making a choice between what were essentially three factory offers. Of course, many factors go into the racing contract process, but it's not difficult to imagine the weight centered, ergo-packaged REV being a crucial factor in the team's decision to sign with Ski-Doo for the 2002 snowcross wars.

Started on a napkin as a what-if and developed through a design process very characteristic of the way Bombardier approaches product development, the REV appeared to thunderous accolades in the winter of 2002.

Because it was "different," its future had remained in doubt much longer than might be supposed from the appearance of the final product produced for the 2003 model year. In fact, the date on the first drawing is 1996. The road to production was relatively long for the REV, featuring an extended gestation in the A/T design studio well prior to the beginnings of serious production engineering. It was a new and different development track utilizing several new and different approaches. It was a process which resulted in a snowmobile that actually deserves the label *new and different*.

Hailed as a milestone by many, the REV will write history in snowmobiling for many reasons beyond its unique design, ergonomics and appearance. The path to production was a unique one reflecting a singular drive by people at Bombardier to get outside everything conventional in snowmobiling and, in the process, create something worthy of the title "advanced concept." ▲



Morgan Team manager Jamie Anseeuw (left) and driver Carl Kuster (on sled) checked out the modified racers under construction during the summer of 2001. Racers took to the radical driver-forward architecture quickly and the REV carded a phenomenal debut season.



Once gated to engineering, things began to happen fast thanks to modern tools like cam-cad and digital imaging. There was an amazingly similarity between the original computer exercise images and the completed prototype of 2000.